Document

Select the documents you wish to save or order by clicking the box next to the document, or click the link above the document to order directly.

☐ **document 3 of 4** Order Document

INSPEC - 1969 to date (INZZ)

Accession number & update
4982808, A9514-6170A-003; 950627.

Title
Effect of rapid thermal annealing treatment on electrical properties and microstructure of **tantalum** oxide thin film deposited by plasma-enhanced chemical vapor deposition.

Author(s)
Seok-Ryong-Jeon; Sung-Wook-Han; Jong-Wan-Park.

Author affiliation
Dept of Metall Eng, Hanyang Univ, Seoul, South Korea.

Source
Journal-of-Applied-Physics (USA), vol.77, no.11, p.5978-81, 1 June 1995.

CODEN
JAPIAU.

ISSN
ISSN: 0021-8979, CCCC: 0021-8979/95/77(11)/5978/4/ ($6.00).

Publication year
1995.

Language
EN.

Publication type
J Journal Paper.

Treatment codes
X Experimental.

Abstract
Effect of high temperature annealing in the temperature range of 600-900 degrees C on the electrical properties and microstructure of **tantalum pentoxide** (Ta/sub 2/O/sub 5/) thin film deposited by plasma- enhanced chemical vapor deposition (PECVD) was studied. Leakage characteristics of the Ta/sub 2/O/sub 5/ thin film annealed at 600 degrees C were found to be the best in this study. However, it was observed that the leakage current in the polycrystalline Ta/sub 2/O /sub 5/ thin film decreased with increasing the annealing temperature above 800 degrees C after a peak for 700 degrees C annealing. The dielectric constant of the annealed Ta/sub 2/O/sub 5/ thin film was 26 after annealing at 600 degrees C, and decreased with the same tendency as the leakage current characteristics. Transmission electron microscopy (TEM) and X-ray diffraction (XRD) analysis indicated that the microstructure of the Ta/sub 2/O/sub 5/ thin film annealed above 800 degrees C was of delta -Ta/sub 2/O/sub 5/ with hexagonal **crystal structure.** Furthermore, TEM and AES observations

revealed that Ta-O-Si transition-layers were formed between the annealed Ta/sub 2/O/sub 5/ thin film and Si substrate. The electrical properties of the Ta/sub 2 /O/sub 5/ films are discussed in terms of interface modification and film densification due to rapid thermal annealing treatment. (16 refs) .

Descriptors

Auger-effect; crystal-microstructure; densification; electrical-conductivity; insulating-thin-films; leakage-currents; permittivity; plasma-CVD-coatings; rapid-thermal-annealing; tantalum-compounds; transmission-electron-microscopy; VLSI; X-ray-diffraction.

Keywords

rapid thermal annealing; electrical properties; microstructure; Ta2O5 thin film; plasma enhanced chemical vapor deposition; ULSI circuits; leakage current; dielectric constant; TEM; X ray diffraction; Auger electron spectra; interface modification; film densification; 600 to 900 C; Ta2O5.

Classification codes

A6170A (Annealing processes).
A6855 (Thin film growth, **structure**, and epitaxy).
A7360H (Electronic properties of insulating thin films).
A6480G (Microstructure).
A7720 (Dielectric permittivity).
A7740 (Dielectric loss and relaxation).
A7920F (Electron-surface impact: Auger emission).
A8280P (Electron spectroscopy for chemical analysis (photoelectron, Auger spectroscopy, etc.)).

Chemical indexing

Ta2O5 bin, Ta2 bin, O5 bin, Ta bin, O bin.

Numerical indexing

temperature: 8.73E+02 to 1.17E+03 K.

Copyright statement

Copyright 1995, IEE.

Dialog DataStar

options logoff feedback help

databases easy search

Advanced Search: INSPEC - 1969 to date (INZZ)

limit

Search history:

No.	Database	Search term	Info added since	Results	
5	INZZ	3 AND 4	unrestricted	4	show titles
6	INZZ	perovskite NEAR crystal ADJ structure	unrestricted	210	show titles
7	INZZ	perovskite NEAR hexagonal	unrestricted	145	show titles
8	INZZ	6 AND 7	unrestricted	3	show titles
9	INZZ	srbi2ta2o9	unrestricted	786	show titles
10	INZZ	srbi2ta2o9 NEAR crystal ADJ structure	unrestricted	0	-
11	INZZ	9 AND hexagonal	unrestricted	1	show titles
12	INZZ	9 AND crystal ADJ structure	unrestricted	60	show titles
13	INZZ	tantalum ADJ pentoxide NEAR perovskite	unrestricted	0	-
14	INZZ	ta2o5 NEAR perovskite	unrestricted	0	-

show complete history | hide history

Enter your search term(s): Search tips

whole document

Information added since: or: none
(YYYYMMDD)

search

Select special search terms from the following list(s):

- Classification codes A: Physics, 0-1
- Classification codes A: Physics, 2-3
- Classification codes A: Physics, 4-5
- Classification codes A: Physics, 6
- Classification codes A: Physics, 7
- Classification codes A: Physics, 8
- Classification codes A: Physics, 9
- Classification codes B: Electrical & Electronics, 0-5
- Classification codes B: Electrical & Electronics, 6-9
- Classification codes C: Computer & Control, 0-9
- Classification codes D: Information Technology, 0-9
- Treatment codes
- INSPEC sub-file
- Publication types
- Language of publication

Top - News & FAQS - Dialog